

CLAIMS:

1. A light-valve system adapted to recycle light, comprising:
 - a light-valve, which is optically coupled to a polarization discriminator; and
 - a light recycling device, which selectively alters the polarization state of light reflected by the polarization discriminator back to the system, wherein the reflected light is transmitted to an imaging surface increasing the brightness of an image.
2. A light-valve system as recited in claim 1, wherein the reflected light substantially uniformly illuminates the imaging surface.
3. A light-valve system as recited in claim 1, wherein the light recycling device includes a rod integrator having a reflective element and an optical retarder at a first end, and a reflective optical retarder at a second end.
4. A light-valve system as recited in claim 1, wherein the optical retarder is a quarter-wave retarder.
5. A light-valve retarder as recited in claim 3, wherein the reflective optical retarder transmits light of a first polarization state and reflects light that is of a second polarization state that is orthogonal to the first polarization state, and wherein the first polarization state is substantially parallel to a transmission axis of the optical retarder at the first end.
6. A light-valve system as recited in claim 1, further comprising a device adapted to sequentially provide red, green and blue light from a light source.
7. A light-valve system as recited in claim 6, wherein the device is a color filter.
8. A light-valve system as recited in claim 6, wherein the device is a color wheel.

9. A light-valve system as recited in claim 1, wherein the light-valve is one of a liquid crystal light-valve, a ferroelectric liquid crystal light-valve or a non-ferroelectric liquid crystal light-valve.
10. A light-valve system as recited in claim 9, wherein the liquid crystal light-valve is one of a twisted nematic liquid crystal light-valve or a liquid crystal on silicon (LCOS) light-valve.
11. A light-valve system as recited in claim 1, wherein the system is a color sequential system.
12. A method of recycling light in a light-valve system, the method comprising:
 - selectively reflecting a portion of light received from a light-valve back to the system;
 - selectively altering the polarization state of light reflected back into the system;
 - and
 - transmitting the reflected light to an imaging surface increasing the brightness of an image.
13. A method as recited in claim 12, wherein the portion of light substantially uniformly illuminates the imaging surface.
14. A method as recited in claim 12, further comprising:
 - providing a rod integrator having a reflective element and an optical retarder at a first end, and a reflective optical retarder at a second end.
15. A method as recited in claim 14, further comprising sequentially transmitting one of red, blue or green light from a light source.

16. A method as recited in claim 12, wherein the light-valve is one of a liquid crystal light-valve, a ferroelectric liquid crystal light-valve or a non-ferroelectric liquid crystal light-valve.

17. A method as recited in claim 16, wherein the liquid crystal light-valve is one of a twisted nematic liquid crystal light-valve or a liquid crystal on silicon (LCOS) light-valve.

18. A light-valve system as recited in claim 1, wherein the system is a color sequential system.